St. Louis
West Lake LF.

0714
Site: West Lake Landfill
ID # MBD079909932
Break: 1.0
Other: AU2
6-27-80

MEMORANDUM

Date: June 27, 1980

To: Robert Robinson, Director, Solid Waste Management Program

From: James H. Long, Director, Laboratory Services Program

Subject: Attached Results at West Lakes Wells

Attached you will find the analytical results for samples collected as part of the routine landfill monitoring program. The collector, Randy Crawford, has previously supplied you with a memo outlining his observations.

The analyses of these samples were performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

DNR 0225

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

REPORT OF SAMPLE ANALYSIS
LANDFILL MONITORING PROJECT

NAME OF FACILITY *West Lakes Wells*

SAMPLES COLLECTED BY *Randy Crawford* DATE(S) *2-20-80*

NOTE:

SAMPLE DESCRIPTION	*Well #38*	*Well #39*	*Well #37A*
DATE COLLECTED	*2-20-80*	*2-20-80*	*2-20-80*
SAMPLE NUMBER	*80-6606*	*80-6607*	*80-6608*
pH Units	*7.0*	*6.9*	*7.2*
Specific Cond. (umhos/cm @ 25° C)	*950*	*1050*	*800*
Milligrams per liter			
BOD	*5*	*<4*	
COD	*44*	*<5*	*36.8*
NH_3 as N	*.05*	*.16*	*.35*
NO_3+NO_2 as N	*<.05*	*<.05*	
Total P	*<.02*	*.02*	
Total Sulfide	*.55*	*.55*	
TOC	*22.0*	*13.0*	
Total Cyanide	*<10*	*<10*	
Non-Filterable Residue (SS)	*23.0*	*37.5*	
Filterable Residue (TDS)	*692*	*792*	
Alkalinity as $CaCO_3$	*362*	*350*	
Fluoride	*.23*	*.17*	
Chloride	*15.14*	*34.38*	
Sulfate			
Hardness as $CaCO_3$ (Ca, Mg, Fe, Zn, Mn)	*531*	*567*	
Potassium , *Dissolved*	*4.49*	*5.55*	*5.55*
Sodium , *Dissolved*	*10.4*	*18.5*	*28.4*
Calcium , *Dissolved*	*140*	*136*	*94.6*
Magnesium , *Dissolved*	*42.8*	*48.4*	*32.2*
Micrograms per liter			
Cadmium , *Dissolved*	*2*	*2*	*4*
Chromium , *Dissolved*	*5*	*3*	*4*
Copper, *Dissolved*	*1*	*<1*	*3*
Iron , *Dissolved, mg/l*	*7.69*	*16.4*	*.360*
Lead , *Dissolved*	*20*	*19*	*37*
Manganese , *Dissolved*	*230*	*680*	*1340*
Mercury, *Dissolved*	*.37*	*<.1*	
Nickel, *Dissolved*	*<32*	*<32*	*<32*
Zinc, *Dissolved*	*697*	*4.80*	*5.27 mg/l*
Arsenic, *Dissolved*	*1*	*2*	*2*
Silver, *Dissolved*	*.2*	*.1*	*.1*

LSP-69/5-5-80

MISSOURI DEPARTMENT OF NATURAL RESOURC
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

REPORT OF SAMPLE ANALYSIS
LANDFILL MONITORING PROJECT

NAME OF FACILITY *West Lakes Wells*

SAMPLES COLLECTED BY *Randy Crawford* DATE(S) *2-20-80*

NOTE:

SAMPLE DESCRIPTION	*Well #35*	*Well #34*	*Well #40*
DATE COLLECTED	*2-20-80*	*2-20-80*	*2-20-80*
SAMPLE NUMBER	*80-6609*	*80-6610*	*80-6611*
pH Units	*7.0*	*6.9*	*7.1*
Specific Cond. (umhos/cm @ 25° C)	*1400*	*1200*	*1750*
Milligrams per liter			
BOD	*Lab Error*	*6*	*5*
COD	*81*	*15*	*< 5*
NH_3 as N	*1.06*	*.03*	*< .01*
NO_3+NO_2 as N	*< .05*	*< .05*	*.05*
Total P	*< .02*	*.05*	*.02*
Total Sulfide	*< 1.0*	*< 1*	*.34*
TOC	*52.0*	*10.7*	*16.0*
Total Cyanide	*12*	*< 10*	*< 10*
Non-Filterable Residue (SS)	*214*	*22.0*	*9.0*
Filterable Residue (TDS)	*962*	*860*	*806*
Alkalinity as $CaCO_3$	*690*	*444*	*502*
Fluoride	*.5*	*.19*	*.17*
Chloride	*32.91*	*39.74*	*57.51*
Sulfate			
Hardness as $CaCO_3$ (Ca, Mg, Fe, Zn, Mn)	*688*	*680*	*608*
Potassium, *Dissolved*	*6.81*	*6.33*	*6.91*
Sodium, *Dissolved*	*19.3*	*19.0*	*26.6*
Calcium, *Dissolved*	*178*	*158*	*165*
Magnesium, *Dissolved*	*51.2*	*54.8*	*43.4*
Micrograms per liter			
Cadmium, *Dissolved*	*2*	*3*	*2*
Chromium, *Dissolved*	*< 1*	*3*	*2*
Copper, *Dissolved*	*1*	*1*	*1*
Iron, *Dissolved, mg/l*	*14.8*	*8.18*	*1.29*
Lead, *Dissolved*	*24*	*35*	*25*
Manganese, *Dissolved*	*5330*	*2100*	*1900*
Mercury, *Dissolved*	*.16*	*< .1*	*< .1*
Nickel, *Dissolved*	*< 32*	*< 32*	*< 32*
Zinc, *Dissolved, mg/l*	*3.46*	*7.01*	*8.82*
Arsenic, *Dissolved*	*27*	*< 5*	*2*
Silver, *Dissolved*	*.2*	*.3*	*.1*

LSP-69/5-5-80

MISSOURI DEPARTMENT OF NATURAL RESOURC
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

REPORT OF SAMPLE ANALYSIS
LANDFILL MONITORING PROJECT

NAME OF FACILITY *West Lakes Wells*

SAMPLES COLLECTED BY *Randy Crawford* DATE(S) *2-20-80*

NOTE:

SAMPLE DESCRIPTION	*Well #41*
DATE COLLECTED	*2-20-80*
SAMPLE NUMBER	*80-6612*
pH Units	*7.4*
Specific Cond. (umhos/cm @ 25° C)	*4200*
Milligrams per liter	
BOD	*5*
COD	*22*
NH_3 as N	*.39*
NO_3+NO_2 as N	*6.8*
Total P	*.03*
Total Sulfide	*<1.0*
TOC	*10.3*
Total Cyanide	*<10*
Non-Filterable Residue (SS)	*7.0*
Filterable Residue (TDS)	*3977*
Alkalinity as $CaCO_3$	*906*
Fluoride	*.18*
Chloride	*366*
Sulfate	
Hardness as $CaCO_3$ (Ca, Mg, Fe, Zn, Mn)	*2068*
Potassium, *Dissolved*	*17.3*
Sodium, *Dissolved*	*445*
Calcium, *Dissolved*	*625*
Magnesium, *Dissolved*	*122*
Micrograms per liter	
Cadmium, *Dissolved*	*6*
Chromium, *Dissolved*	*<1*
Copper, *Dissolved*	*6*
Iron, *Dissolved*	*20*
Lead, *Dissolved*	*26*
Manganese, *Dissolved*	*700*
Mercury, *Dissolved*	*.27*
Nickel, *Dissolved*	*46*
Zinc, *Dissolved*	*11.0*
Arsenic, *Dissolved*	*1*
Silver, *Dissolved*	*<1*

LSP-69/5-5-80

REITZ & JENS, INC.
CONSULTING ENGINEERS
111 SOUTH MERAMEC AVENUE
ST. LOUIS, MISSOURI 63105
(314) 727-0403

HENRY M. REITZ, PRESIDENT
STIFEL W. JENS, SENIOR VICE PRESIDENT
JOHN J. BAILEY, JR., VICE PRES., CHIEF ENG.
DAVID E. MURRAY, VICE PRESIDENT
DONALD S. ESKRIDGE, SECRETARY

SOIL MECHANICS-FOUNDATIONS
HYDROLOGY-HYDRAULICS
RESOURCE RECLAMATION
DRAINAGE-PAVEMENTS
LAND DEVELOPMENT
WATER RESOURCES
SOLID WASTE

Dec. 27, 1979

Mr. Robert M. Robinson, Director
Solid Waste Management Program
Mo. DNR
Box 1368
Jefferson City, MO 65102

Re: West Lake Laddfill

Dear Mr. Robinson:

Enclosed for your review and file, are two copies of test analysis from West Lake Landfill water samples, along with a well location map and groundwater elevation sheet.

If there are any questions, please call.

Very truly yours,

David E. Murray

DAVID E. MURRAY

Encl.
DEM/ds
cc: West Lake Landfill Inc.

envirodyne
engineers
12161 Lackland Road
St. Louis, Missouri 63141
(314) 434-6960

REPORT OF ANALYSIS

Environment • Energy • Transportation • Food Processing

SUBMITTED BY: Mr. Bill Canney
West Lake Quarry
Rt. 1, Box 206
Bridgeton, Missouri 63044

RECEIVED DEC 26 1979 P.O. REITZ & JENS, INC.

DATE: 12/17/79
PROJECT NO. 1536-019

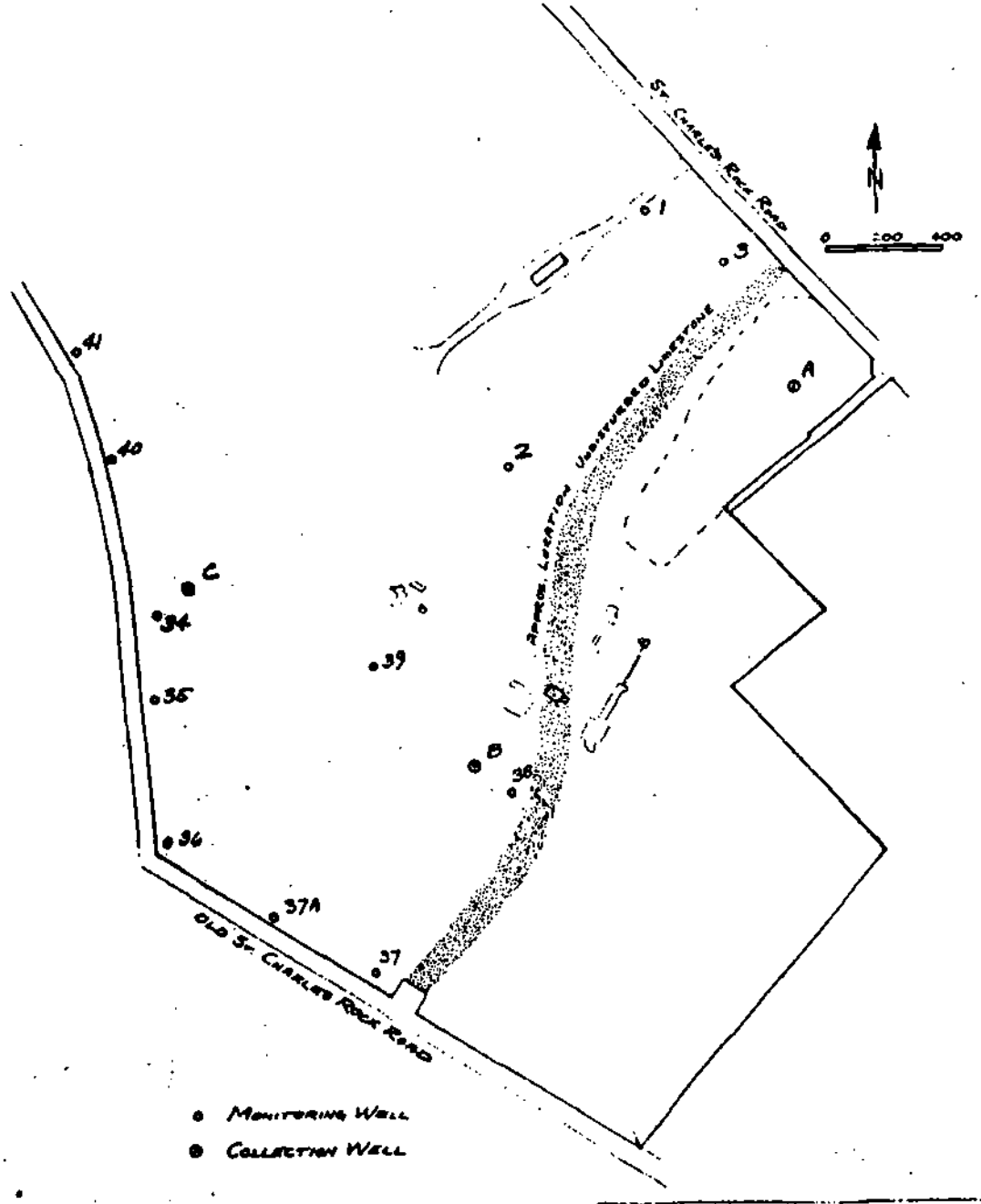
DATE RECEIVED: November 29, 1979
SAMPLE ANALYZED: 7 Water Samples
METHODS USED: Standard Methods, 14th Edition

RESULTS:

	Site	pH (units)	COD (mg/l)	Conductivity (micromhos/cm)	Chloride (mg/l)	Iron (mg/l)
✓	34	6.6	36	850	53	0.96
✓	35	6.9	71	900	49	5.56
	37A	6.8	45	620	51	2.13
	38	7.0	27	720	20	6.56
✓	39	6.8	18	830	30	4.56
	40	6.6	43	920	58	1.14
	41	6.7	51	3400	478	2.07

ENVIRODYNE ENGINEERS

BY: Judy Stone



WEST LAKE LANDFILL INC.

WELL LOCATION MAP

REITZ & JENS INC. DEC. 1979

WESTLAKE LANDFILL

Groundwater Elevations

Monitoring Well	Top of Pipe Elevation	Surface Elevation	11/16/79
1	456.44	(ground level)	dry
2	449.7	447.7	dry
3	442.33	-	dry
34	478.4	475.1	430.7
35	475.1	471.9	430.6
36	471.0	470.0	dry
37	459.9	458.8	dry
37A	477.5	474.4	430.5
38	462.6	458.9	432.4
39	465.4	462.7	430.6
40	480.5	477.4	430.3
41	485.5		431.2
Collection Well			
A 48" RCP	429.1	-	343.1
B 48" RCP	476.4	468.0	440.2
C 24" RCP	476.0	471.0	447.0

REITZ & JENS, INC.
November 1979

BUILDING STONE
FLAGSTONE
RUBBLE
CRUSHED STONE (ANY SIZE)
SCREENINGS
LIMESTONE
RIP RAP
SAND
ASPHALT

Area Code 314 739-1122

West Lake Quarry & Material Co.

St. Charles Rock Road W. of Taussig
St. Louis County, Mo.
MAILING ADDRESS:
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MO.
63044

July 23, 1979

Missouri Department of Natural Resources
Division of Environmental Quality
P.O. Box 1368
Jefferson City, Missouri 65102

Attn: Robert M. Robinson PE
Director
Solid Waste Management Program

Gentlemen:

Shown are approximate locations of monitoring wells on completed landfill also the latest analysis.
I apologize for taking so long.

Sincerely,

WEST LAKE QUARRY & MATERIAL CO.

Bill Canney

Bill Canney

BC:dg

JUL 25 1979

envirodyne engineers
12161 Lackland Road
St. Louis, Missouri 63141
(314) 434-6960

REPORT OF ANALYSIS

Environment • Energy • Transportation • Food Processing

SUBMITTED BY: Mr. William Canney
West Lake Quarry
Rt. 1, Box 296
Bridgeton, MO 63042

DATE: July 3, 1979
PROJECT NO. 1536-019
P.O.

DATE RECEIVED: June 6, 1979
SAMPLE ANALYZED: Nine Water Samples
METHODS USED: Standard Methods, 14th Edition

RESULTS:

Sample	pH Units	Conductivity (micromhos/cm)	Chloride (mg/l)	COD (mg/l)	Iron (mg/l)
35	6.3	1,250	96	150	7.41
37A	6.1	1,450	84	86	8.51
✓ 37	6.5	750	44	160	110
38	6.9	1,250	52	150	8.09
39	6.3	1,300	66	200	9.85
40	6.6	1,100	76	220	5.62
41	6.8	710	85	420	9.56
34	6.5	1,650	74	270	6.06
36	6.4	1,200	31	370	41.8

JUL 25 1979

ENVIRODYNE ENGINEERS

BY: Judy Stone

March 13, 1979 MAR 15 1979

Enclosed are results of analysis on seven (7) monitoring wells at West Lake Landfill.

Bill Canney

eng eers
12191 Lackland Road
St. Louis, Missouri 63141
(314) 434-6960

MAR 5 1979

REPORT OF ANALYSIS

Environment • Energy • Transportation • Food Processing

SUBMITTED BY: Mr. William Canney
West Lake Quarry
Rt. #1, Box 206
Bridgeton, MO 63012

DATE: 2/19/79
PROJECT NO. 1536-019
P.O.

DATE RECEIVED: January 12, 1979
SAMPLE ANALYZED: Seven water samples
METHODS USED: Standard Methods, 14th Edition

RESULTS:

	Samples						
Parameter	35	36	37	38	39	40	41
Alkalinity	160	150	140	210	140	220	310
pH	7.2	7.4	6.5	7.7	7.8	7.7	7.6
COD	220	130	170	180	100	160	400
BOD	52	20	7	18	11	15	88
TOC	74	43	45	57	33	51	120
Dissolved Solids	372	550	550	530	510	610	860
Conductivity	1,940	1,700	1,650	1,550	1,650	1,360	1,080
Hardness (EDTA)	250	320	370	350	320	390	540
Phosphate, total	0.49	0.15	0.58	0.21	0.04	0.04	0.12
Chloride	94	100	110	76	76	94	140
Fluoride*	0.72	0.80	0.78	0.87	0.73	0.84	0.82
Ammonia	<1	<1	<1	<1	<1	<1	<1
Nitrate	1.1	0.15	0.10	0.18	0.09	1.3	3.2
Sulfate	48	110	160	140	160	160	190
Sulfide	1.4	0.4	4.8	0.4	0.1	0.6	<0.1
Cyanide	Analysis to be run on new samples.						

Values are reported as mg/l, except conductivity which is micromhos/cm.

*Run on new samples taken 2/13/79.

ENVIRODYNE ENGINEERS

BY: Judy Stone

envi. ODYNE
engineers
12161 Lackland Road
St. Louis, Missouri 63141
(314) 434-6980

REPORT OF ANALYSIS

SUBMITTED BY: Mr. William Canney
West Lake Quarry
Rt. #1, Box 206
Bridgeton, MO 63012

DATE: 2/19/79
PROJECT NO. 1536-019
P.O.

DATE RECEIVED: January 12, 1979
SAMPLE ANALYZED: Seven water samples
METHODS USED: Standard Methods, 14th Edition

RESULTS:

	✓	✓	✓	Samples			
Parameter	35	36	37	38	39	40	41
Arsenic	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Calcium	46	72	67	83	61	97	210
Chromium	<0.01	<0.01	0.01	0.02	< 0.01	0.03	0.03
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	3.5	2.4	7.4	2.2	2.6	3.9	18
Potassium	6.2	7.1	4.8	9.9	8.4	12	12
Lead	0.041	0.015	0.015	0.006	0.005	0.013	0.059
Magnesium	29	31	19	41	39	45	60
Manganese	0.31	1.4	0.93	0.55	0.26	0.69	0.75
Mercury	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	<0.0002	< 0.0002
Nickel	<0.01	<0.01	<0.01	0.02	0.03	0.10	0.12
Silver	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium	110	38	25	44	44	48	65
Zinc	5.5	2.7	15	4.0	3.7	17	2.8

Values are reported as mg/l.

ENVIRODYNE ENGINEERS

BY: Judy Stone

envirodyne engineers
12161 Lackland Road
St. Louis, Missouri 63141
(314) 434-6960

REPORT OF ANALYSIS

Environment • Energy • Transportation • Food Processing

SUBMITTED BY: Mr. William Canney
West Lake Quarry
Rt. #1, Box 206
Bridgeton, Missouri 63012

DATE: 2/27/79
PROJECT NO. 1536-019
P.O.

DATE RECEIVED: February 13, 1979
SAMPLE ANALYZED: Seven water samples
METHODS USED: Standard Methods, 14th Edition

RESULTS:

Sample	Cyanide, mg/l
35	<0.02
36	<0.02
37A	<0.02
38	<0.02
39	<0.02
40	<0.02
41	<0.02

These samples were taken to replace samples from 1/12/79.

ENVIRODYNE ENGINEERS

BY: Judy Stone

Westlab's Sampling
10-31-80

ROUTINE LANDFILL PARAMETERS
ATTACHMENT SHEET FOR CHAIN OF CUSTODY
EFFECTIVE DATE: MAY 1980

pH
~~Alkalinity~~
Specific
Conductance

Normally handled as field analyses -- may be analyzed in the lab on occassion

- ✓BOD_5
- ✓COD
- ✓TOC
- ✓N.F. Residue
- ✓Filt. Residue
- ✓NH_3 as N
- ✓NO_3+NO_2 as N
- ✓Total P
- ✓Chloride
- ~~Cyanide~~
- ✓Fluoride
- ✓Sulfate
- ~~Sulfide~~
- ✓Hardness (By calculation--Ca, Mg, Fe, Zn, Mn)

Total or Dissolved Metals (see Chain of Custody)

- As
- Cd
- Cr
- Cu
- Fe
- Pb
- ~~Mn~~
- Hg
- ~~Ni~~
- Ag
- Zn
- ~~Ca~~
- ~~Mg~~
- ~~K~~
- ~~Na~~

- Ba
- Se
- ✓Color
- ✓Odor
- ✓MSAB

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80-7129

Date Rec'd 10-31-80

Location West Lake Landfill Boring # 3

Collector Crawford Affiliation WAMS Date 10-30-80

	Parameter	Results	Units	By
	BOD_5	7	mg/l	AW
✓	COD	35.1	mg/l	SH
✓	TOC	No Result	mg/l	
✓	N. F. Residue	8496	mg/l	MW
✓	Filt. Residue	392	mg/l	MW
	Oil & Grease		mg/l	
✓	NH_3 as N	0.11	mg/l	AW
✓	$NO_3 + NO_2$ as N	0.22	mg/l	AW
	Organic N		mg/l	
	O - PO_4 as P		mg/l	
	Diss. O-PO_4 as P		mg/l	
	Total P	0.16	mg/l	AW
/	Chloride	16.4	mg/l	AW
	Cyanide		mg/l	
½	Fluoride	0.32	mg/l	AH
	M B A S	0.07	mg/l	AW
	Phenols		mg/l	
	Sulfate	78	mg/l	AH
	Sulfide		mg/l	
	Acidity as $CaCO_3$		mg/l	
	Alk. as $CaCO_3$		mg/l	
	Color	<25	Cu	SH
	Diss. Oxygen		mg/l	
/	T. Hard./$CaCO_3$	585	mg/l	AW
/	Odor	0	T.O.N	SH
/	pH Field	7.0	---	RC
/	Sp. Conductance Field	1100	umho/cm 25°C	RC
/	Temperature Field	15	°C	RC
	Turbidity		NTU	

Elements (ug/l unless noted otherwise)

	✓	Diss.	By	✓	Total	By
Al						
As	✓	1	JS			
Ba	✓	500	SH			
Cd	✓	0.8	JS			
Cr	✓	<1	JS			
Cu	✓	11	JS			
Fe	✓	1200	JS			
Pb	✓	4	JS			
Mn	✓	1100	JS			
Hg	✓	<0.1	SH			
Ni						
Se	✓	3	JS			
Ag	✓	<02	SH			
Zn	✓	550	JS			
Ca, mg/l						
Mg, mg/l						
K, mg/l						
Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	
	PCB's			

Remarks: * Instrument failure

Reported To: _____, Date _____ Reviewed By dmp, Date DEC 23 1980

27-80/LSP-61

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80-7130

Date Rec'd 10-31-80

ion West Lake Landfill Boring # 4

Affiliation WQMS

Date 10-30-80

	Parameter	Results	Units	By
	BOD_5	17	mg/l	AW
✓	COD	42.2	mg/l	SH
✓	TOC	No Result	mg/l	
✓	N. F. Residue	7310	mg/l	MW
✓	Filt. Residue	2040	mg/l	MW
	Oil & Grease		mg/l	
✓	NH_3 as N	0.23	mg/l	MW
✓	$NO_3 + NO_2$ as N	0.06	mg/l	AW
	Organic N		mg/l	
	O - PO_4 as P		mg/l	
	Diss. O-PO_4 as P		mg/l	
✓	Total P	0.06	mg/l	AW
	Chloride	102	mg/l	AW
	Cyanide		mg/l	
✓	Fluoride	0.20	mg/l	AH
✓	M B A S	0.06	mg/l	MW
	Phenols		mg/l	
	Sulfate	37	mg/l	AH
	Sulfide		mg/l	
	Acidity as $CaCO_3$		mg/l	
	Alk. as $CaCO_3$		mg/l	
	Color	<25	Cu	SH
	Diss. Oxygen		mg/l	
	T. Hard./$CaCO_3$	747	mg/l	AW
	Odor	2	T.O.N.	SH
	pH field	6.7	---	RC
	Sp. Conductance field	—	umho/cm 25°C	RC
	Temperature field	15	°C	RC
	Turbidity		NTU	

Elements (ug/l unless noted otherwise)

	✓	Diss.	By	✓	Total	By
Al						
As	✓	2	J.S.			
Ba	✓	400	SH			
Cd	✓	1.3	JS			
Cr	✓	6	J.S.			
Cu	✓	7	JS			
Fe	✓	1000	JS			
Pb	✓	2	JS			
Mn	✓	4400	JS			
Hg	✓	<0.1	SH			
Ni						
Se	✓	<5	JS			
Ag	✓	<0.2	SH			
Zn	✓	198	JS			
Ca, mg/l						
Mg, mg/l						
K, mg/l						
Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	
	PCB's			

marks: Instrument failure?

ted To: _____, Date _____ Reviewed By _____, Date DEC 23 1980

80/LSP-61

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80 [illegible]

Date Rec'd 10/31/80

Location West Lake Sanitary Landfill, Boring #5 (Along St. Charles Rock Rd.)

Collector C. Crawford Affiliation MSD Date 10/31/80

	Parameter	Results	Units	By
✓	BOD_5	9	mg/l	AW
✓	COD	16.9	mg/l	SH
✓	TOC	no Result	mg/l	
✓	N. F. Residue	896	mg/l	MW
✓	Filt. Residue	120	mg/l	MW
	Oil & Grease		mg/l	
✓	NH_3 as N	0.02	mg/l	AW
✓	$NO_3 + NO_2$ as N	0.36	mg/l	AW
	Organic N		mg/l	
	O - PO_4 as P		mg/l	
	Diss. O-PO_4 as P		mg/l	
✓	Total P	0.10	mg/l	AW
✓	Chloride	14.3	mg/l	AW
	Cyanide		mg/l	
✓	Fluoride	0.17	mg/l	AH
✓	M B A S	0.15	mg/l	MW
	Phenols		mg/l	
✓	Sulfate	141	mg/l	AH
	Sulfide		mg/l	
	Acidity as $CaCO_3$		mg/l	
	Alk. as $CaCO_3$		mg/l	
✓	Color	<25	Cu	SH
	Diss. Oxygen		mg/l	
✓	T. Hard./$CaCO_3$	577	mg/l	AW
✓	Odor	0	T.O.N.	SH
✓	pH field	6.7	---	RC
✓	Sp. Conductance field	1200	umho/cm 25°C	RC
✓	Temperature field	18	°C	RC
	Turbidity		NTU	
	~~[illegible]~~			

Elements (ug/l unless noted otherwise)						
	✓	Diss.	By	✓	Total	By
Al						
As	✓	<5	JS			
Ba	✓	200	SH			
Cd	✓	0.9	JS			
Cr	✓	4	JS			
Cu	✓	4	JS			
Fe	✓	400	JS			
Pb	✓	2	JS			
Mn	✓	300	JS			
Hg	✓	<0.1	SH			
Ni						
Se	✓	<5	JS			
Ag	✓	<0.2	SH			
Zn	✓	132	JS			
Ca, mg/l						
Mg, mg/l						
K, mg/l						
Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	

Remarks: Instrument failure

Reported To: _____, Date _____ Reviewed By dnp, Date DEC 23 1980

3-27-80/LSP-61

3-27-80/LSP-61

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80-7125

Date Rec'd 10-30-80

Sample Description West Lakes Landfill Boring # 1

Collector R. Crawford Affiliation WQAS Date 10/29/80

Remarks

✓	Parameter	Results	Units	By
✓	BOD_5	16	mg/l	AW
✓	COD	44.4	mg/l	SH
✓	TOC	25.8	mg/l	SH
✓	N. F. Residue	No Result	mg/l	
✓	Filt. Residue	No Result*	mg/l	
	Oil & Grease		mg/l	
✓	NH_3 as N	0.84	mg/l	AW
✓	$NO_3 + NO_2$ as N	0.54	mg/l	AW
	Organic N		mg/l	
	O - PO_4 as P		mg/l	
	Diss. O-PO_4 as P		mg/l	
✓	Total P	0.21	mg/l	AW
✓	Chloride	6.5	mg/l	AW
	Cyanide		mg/l	
✓	Fluoride	0.42	mg/l	AH
✓	M B A S	0.34	mg/l	MW
	Phenols		mg/l	
✓	Sulfate	79	mg/l	AH
	Sulfiue		mg/l	
	Acidity as $CaCO_3$		mg/l	
	Alk. as $CaCO_3$		mg/l	
✓	Color	<25	Cu	SH
	Diss. Oxygen		mg/l	
✓	T. Hard./$CaCO_3$	370	mg/l	AW
✓	Odor	0	T.O.N.	SH
✓	pH field	6.6	---	RC
✓	Sp. Conductance field	500	umho/cm 25°C	RC
✓	Temperature field	—	°C	RC
	Turbidity		NTU	

✓	Elements (ug/l unless noted otherwise)						
	———	✓	Diss.	By	✓	Total	By
	Al						
	As	✓	1	QS			
	Ba	✓	600	SH			
	Cd	✓	0.3	JS			
	Cr	✓	2	QS			
	Cu	✓	3	JS			
	Fe	✓	150	JS			
	Pb	✓	2	JS			
	Mn	✓	1000	JS			
	Hg	✓	<0.1	SH			
	Ni						
	Se	✓	2	JS			
	Ag	✓	<0.2	SH			
	Zn	✓	200	JS			
	~~Be~~	~~✓~~					
	~~Sr~~	~~✓~~					
	Ca, mg/l						
	Mg, mg/l						
	K, mg/l						
	Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	
	PCB's			

Remarks: * No unfiltered Sample

DEC 23 1980

Reported To: _____, Date _____ Reviewed By DSP, Date _____

3-27-80/LSP-61

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80-7126

Date Rec'd 10-30-80

...ion Westlake Landfill Slough on N.W. edge grab
Crawford Affiliation W.R.D.S. Date 10-29-80

Parameter	Results	Units	By
BOD_5	<4.	mg/l	AW
COD	13.8	mg/l	SH
TOC	<1	mg/l	SH
N. F. Residue	9	mg/l	MW
Filt. Residue	366	mg/l	MW
Oil & Grease		mg/l	
NH_3 as N	0.04	mg/l	AW
$NO_3 + NO_2$ as N	0.08	mg/l	AW
Organic N		mg/l	
O - PO_4 as P		mg/l	
Diss. O-PO_4 as P		mg/l	
Total P	0.07	mg/l	AW
Chloride	57.8	mg/l	AW
Cyanide		mg/l	
Fluoride	0.36	mg/l	AH
M B A S	<0.04	mg/l	MW
Phenols		mg/l	
Sulfate	56	mg/l	AH
Sulfide		mg/l	
Acidity as $CaCO_3$		mg/l	
Alk. as $CaCO_3$		mg/l	
Color	<25	Cu	SH
Diss. Oxygen		mg/l	
Hard./$CaCO_3$	244	mg/l	AW
Nitr	0	T.O.N.	SH
pH field	7.5	---	RC
Conductance field	745	umho/cm 25°C	RC
Temperature field	9°C	°C	RC
Turbidity		NTU	
~~Cl2~~			

Elements (ug/l unless noted otherwise)	✓	Diss.	By	✓	Total	By
Al						
As				✓	<5	DS
Ba				✓	200	SH
Cd				✓	0.1	DS
Cr				✓	<1	JS
Cu				✓	<1	JS
Fe				✓	240	JS
Pb				✓	2	JS
Mn				✓	70	JS
Hg				✓	<0.1	SH
Ni						
Se				✓	<5	JS
Ag				✓	<01	JS
Zn				✓	14	JS
Ca, mg/l						
Mg, mg/l						
K, mg/l						
Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	

...ks:

...l To: _____, Date _____ Reviewed By dsp, Date _____

...LSP-61

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80-7127

Date Rec'd 10-31-80

on West Lakes Landfill Boring # 2

Crawford Affiliation W.Q.M.S. Date 10-30-80

Parameter	Results	Units	By
BOD_5	6	mg/l	AW
COD	37.8	mg/l	SH
TOC	33.0	mg/l	SH
N. F. Residue	15452	mg/l	mw
Filt. Residue	684	mg/l	mw
Oil & Grease		mg/l	
NH_3 as N	0.22	mg/l	AW
$NO_3 + NO_2$ as N	0.98	mg/l	AW
Organic N		mg/l	
O - PO_4 as P		mg/l	
Diss. O-PO_4 as P		mg/l	
Total P	0.37	mg/l	AW
Chloride	42.1	mg/l	mw
Cyanide		mg/l	
Fluoride	0.25	mg/l	AH
M B A S	0.06	mg/l	AW
Phenols		mg/l	
Sulfate	159	mg/l	AH
Sulfide		mg/l	
Acidity as $CaCO_3$		mg/l	
Alk. as $CaCO_3$		mg/l	
Color	<25	Cu	SH
Diss. Oxygen		mg/l	
Hard./$CaCO_3$	465	mg/l	AW
Odor	0	T.O.N	SH
pH Field	7.2	---	RC
Spec. Conduct. Field	1100	umho/cm 25°C	RC
Temperature Field	12	°C	RC
Turbidity		NTU	

Elements (ug/l unless noted otherwise)	✓	Diss.	By	✓	Total	By
Al						
As	✓	2	JS			
Ba	✓	700	SH			
Cd	✓	1.0	JS			
Cr	✓	2	JS			
Cu	✓	11	JS			
Fe	✓	400	JS			
Pb	✓	3	JS			
Mn	✓	600	JS			
Hg	✓	<0.1	SH			
Ni						
Se	✓	5	JS			
Ag	✓	<0.2	SH			
Zn	✓	1310	JS			
Ca, mg/l						
Mg, mg/l						
K, mg/l						
Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	
	PCB's			

Marks:

Sent To: _____, Date _____ Reviewed By dsp, Date DEC 23 1980

MO/LSP-61

MISSOURI DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

Sample No. 80-7128

Date Rec'd 10-31-80

Location West Lake Landfill, Black Diamond Lake, Hush
Crawford Affiliation MDNR Date 10-30-80

Parameter	Results	Units	By
BOD_5	>444	mg/l	AW
COD	845	mg/l	SH
TOC	302	mg/l	SH
N. F. Residue	24	mg/l	MW
Filt. Residue	2064	mg/l	MW
Oil & Grease		mg/l	
NH_3 as N	108	mg/l	MW
$NO_3 + NO_2$ as N	<0.05	mg/l	AW
Organic N		mg/l	
O - PO_4 as P		mg/l	
Diss. O-PO_4 as P		mg/l	
Total P	1.0	mg/l	AW
Chloride	355.	mg/l	AW
Cyanide		mg/l	
Fluoride	0.54	mg/l	AH
M B A S	0.07	mg/l	MW
Phenols		mg/l	
Sulfate	29	mg/l	AH
Sulfide		mg/l	
Acidity as $CaCO_3$		mg/l	
Alk. as $CaCO_3$		mg/l	
Color	1000	Cu	SH
Diss. Oxygen		mg/l	
T. Hard./$CaCO_3$	718	mg/l	AW
Odor	1000	T.O.N.	SH
pH field	7.5	---	RC
Sp. Conductance field	4000	umho/cm 25°C	RC
Temperature field	14	°C	RC
Turbidity		NTU	

Elements (ug/l unless noted otherwise)

	✓	Diss.	By	✓	Total	By
Al						
As				✓	5	J.S.
Ba				✓	300	SH
Cd				✓	0.2	JS
Cr				✓	12	JS
Cu				✓	1	JS
Fe				✓	3200	JS
Pb				✓	<1	JS
Mn				✓	500	JS
Hg				✓	<0.1	SH
Ni						
Se				✓	<5	JS
Ag				✓	<0.1	JS
Zn				✓	238	JS
Ca, mg/l						
Mg, mg/l						
K, mg/l						
Na, mg/l						

✓	Parameter	Results	Units	By
	Fecal Coliform		Ct/100ml	
	Fecal Strep.		Ct/100ml	
	PCB's			

Remarks:

Reported To: _____, Date _____ Reviewed By dnp, Date DEC 23 1980

7-80/LSP-61

Hildorfe

Rock 11/20/80

Report of Radionuclide Analysis of
Water Sample
Public Water Supply
U.S. Environmental Protection Agency

(To be filled out by public water supply)

Date Received - 11/20/80

Westlake Quarry
~~PWS ID NO.~~ 80-7127
PWS Name Dept. Natural Resources
Address P.O. Box 1368
City Jefferson City State Mo Zip Code 65102

Date Sampled 10 (Mo.) 30 (Day) 80 (Year) - 10:00 A.M.

(To be filled out by laboratory)

Lab Running Sample: Dept. of Community Health & Medical Care
Address and City: Environ. Health Laboratories, 801 S. Brentwood Blvd., Clayton, Mo. 63105
Lab ID No, 00260 Analyst Staff

Contaminant Name	Analysis Result	Analysis Date (Mo. Day Yr)	Analysis Method
Gross Alpha Particle Activity (5pc./l	8.2 ± 3.1 pCi/l	12 14 80	Std Meth.
Radium - 226	0.6 ± 1.0 pCi/l	12 4 80	EPA-600/4-75-008R
~~Radium - 228~~			
Gross Beta Particle Activity (50pc./l			
Tritium			
Strontium - 90			
Iodine - 131			
Cesium - 134			

This form must accompany the radionuclide cubitainer to the laboratory. The public water supply will be notified by the Water Supply Field Office, U.S. EPA of the results of the radionuclide examinations.

Three Lake Sample

Read 11/20/80

Report of Radionuclide Analysis of
Water Sample
Public Water Supply
U.S. Environmental Protection Agency

(To be filled out by public water supply)

Date Received in Lab - 11/20/80

~~West Lake Quarry~~ PWS ID NO. 80-7130

PWS Name Dept. NATURAL RESOURCES

Address P.O. BOX 1368

City JEFFERSON CITY

Date 10 / 30 / 80 5:00 P.M.
(Mo.) (Day) (Year)

Sample

State MO Zip Code 65102

(To be filled out by laboratory)

Lab Running Sample Address and City: Dept. of Community Health & Medical Care
Environ. Health Laboratories
801 S. Brentwood Blvd.
Clayton, Mo. 63105

Lab ID No.

Analyst

Contaminant Name	Analysis Result	Analysis Date (Mo. Day Yr)	Analysis Method
Gross Alpha Particle Activity (5pc./l	~~35~~ pCi/l	12 / 4 / 80	St. Meth.
Radium - 226	0.5 pCi/l	12 / 4 / 80	EPA-600/4-75-00-012
Radium - 228		/ /	
Gross Beta Particle Activity (50pc./l		/ /	
Tritium		/ /	
Strontium - 90		/ /	
Iodine - 131		/ /	
Cesium - 134		/ /	

This form must accompany the radionuclide cubitainer to the laboratory. The public water supply will be notified by the Water Supply Field Office, U.S. EPA of the results of the radionuclide examinations.

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

MEMORANDUM

Date: October 27, 1980

To: Keith Schardein, Supervisor,
Water Quality Monitoring Section

From: James H. Long, Director,
Laboratory Services Program

Subject: Sampling Project - Westlake Landfill

The Laboratory Services Program has been requested to perform additional monitoring at Westlake Landfill in St. Louis County. The following items constitute the thrust of the request:

1. Collection of samples during the Division of Geology and Land Survey flow profile borings, -Parameters to be analyzed-Standard Landfill Monitoring Parameters.

2. Collection of a samples from Black Diamond Lake and from the major flow into the lake from the quarry face, -Parameters to be analyzed-Standard Landfill Monitoring Parameters.

3. Collection of samples and measurement of depth in the leachate monitoring well between old fill area and Black Diamond Lake, -Parameters to be analyzed-Standard Landfill Monitoring Parameters.

4. Collection of depth discreet samples from pit along St. Charles Rock Road, -Parameters to be analyzed-Standard Landfill Monitoring Parameters.

5. Collection of sediment samples and fish from pit along St. Charles Rock Road, -Parameters to be analyzed-Heavy Metals and Chlorinated Hydrocarbons.

Coordinate with Rohel W. Amundson for transmittal of samples and scheduling of analyses.

JHL/ds

UPDATE ON WESTLAKE LANDFILL

NOV 17 1980

HISTORY OF WESTLAKE LANDFILL

Westlake Landfill, located in Bridgeton Missouri (St. Louis County) has been the subject of recent inquiry. This landfill began operation prior to state regulation. As far as our records show, this landfill first opened in the med-1960's. Part of the landfill lies in an old quarry and part of the landfill lies in the Missouri River floodplain, approximately 1 1/2 miles from the river. Witnesses to this operation, when the area of the landfill which lies in the floodplain was in operation, note that the fill area was often actually beneath the level of the water table. Leachate from the old quarry area of the landfill is collected and hauled to MSD treatment plants. Construction of onsite treatment is underway. About 48,000 gallons of leachate per day is currently being collected.

CHEMICAL WASTES

Aside from normal landfill materials, there are chemical industrial wastes and radiologically contaminated materials deposited in this landfill. The chemical wastes, that we know of, include about 4,000 tons of residues from the production of insecticides and herbicides. These pesticide wastes were deposited by Chevron Chemical Company. Also included in the chemical wastes are waste materials from ink manufacture and from the manufacture of glue. Among the chemical wastes that we know of in Westlake Landfill are:

waste ink	pigments	oily sludges
esters	alcohols	insecticides
halogenated intermediates	-wastewater sludges	aromatics
oils	-asbestos	herbicides
heavy metals		

RADIOACTIVE WASTES

In addition to the hazardous chemical wastes in Westlake Landfill, there are radioactive wastes. During early 1973 Cotter Corporation buried radioactive Barium Sulfate Slag material and radiologically contaminated building rubble. There are approximately 43,000 tons of this material which contain about 7,000 tons of natural Uranium.

In October, 1977, an aerial radiological survey was done to determine the location of the burial of this contaminated material (see attached map). It was determined from the aerial survey that there are two areas within the landfill which are emitting abnormally high levels of radiation. The southernmost area is the result of the burial of contaminated Barium Sulfate Slag from the Mallinkrodt area of the Destrehen street Uranium processing plant. (This facility in downtown St. Louis is where material for the original nuclear weapons tests was produced.) The northermost area contamination is on the edge of the floodplain area which is the boundary of neighboring farmland. The reason for its elevated gamma radiation is unknown at this time. The U. S. Nuclear Regulatory Commission has contracted Radiation Management Corporation to do extensive on-site radiological surveys which include groundwater analysis, core sampling, test boring, and other tests as deemed necessary. This study should determine the reason for the elevated gamma radiation (see attached NRC announcement).

CURRENT DNR MONITORING ACTIVITY

Geological reports from DNR's Division of Geology and Land Survey indicated that the local groundwater flows Northeast from the landfill into the Missouri River alluvial floodplain. Therefore, it is highly probably that leachate from the landfill is contaminating local wells and entering the waters of the Missouri River. As a result, DNR has initiated sampling and monitoring activities. On September 20 and October 1, 1980, a groundwater investigation was conducted in the vicinity of the Westlake Landfill. Two monitoring wells on the landfill site and three provate wells located Northwest of the landfill were sampled (see attached report). The Division of Geology and Land Survey groundwater experts have evaluated data from this sampling and determined that levels of several pollutants were significantly higher than what one would expect as background levels. Chloride, Sodium, Lead, and Manganese showed particularly high levels. Except for Manganese, the levels were not in violation of drinking water standards, but were high enough for

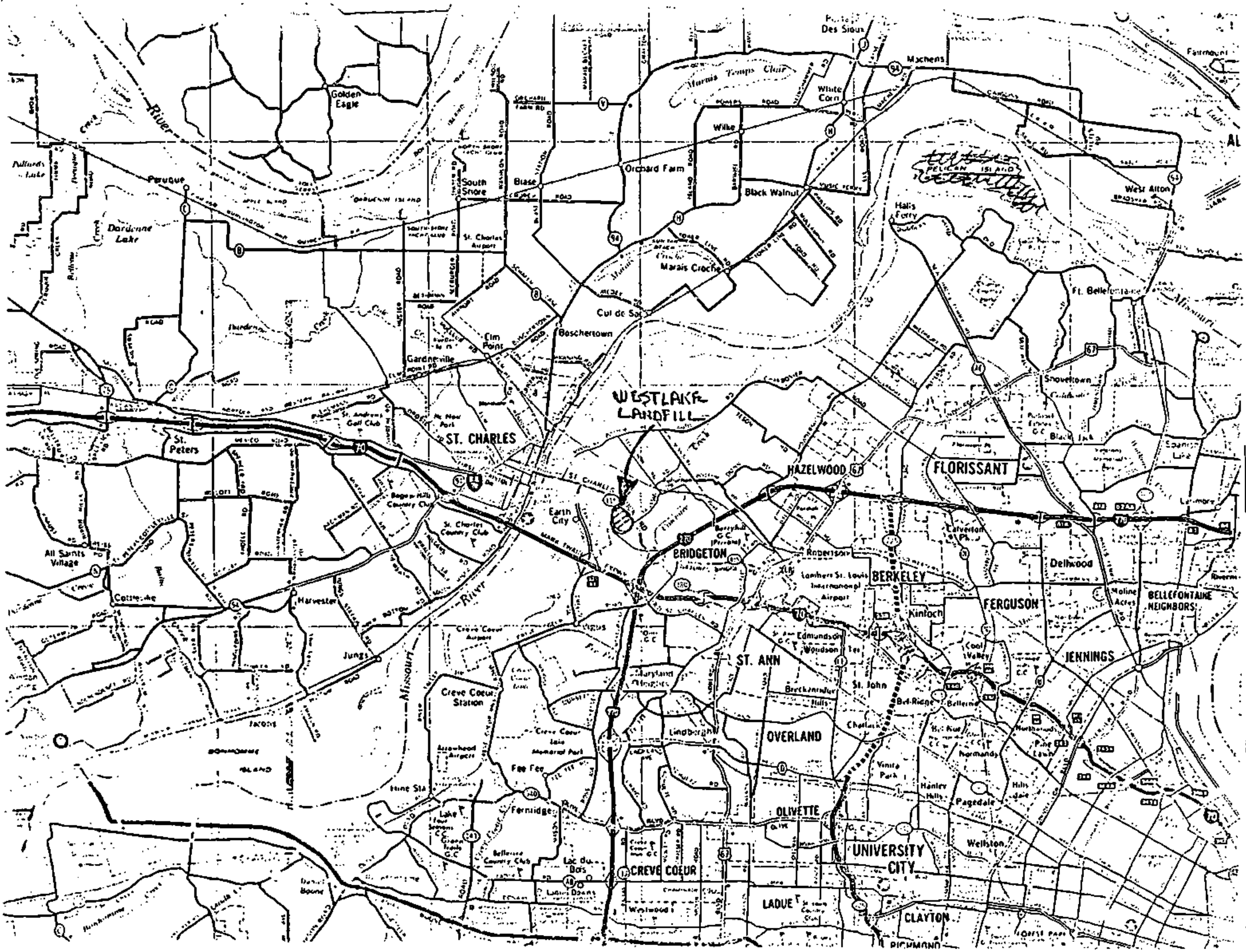
concern.* Because of this concern, additional sampling is being conducted in the last week of October.

Since the NRC will be conducting investigations on radioactive contamination, DNR has requested permission to use some of their facilities to aid in our hazardous chemical waste investigation.

The NRC has given DNR verbal permission to utilize the monitoring wells which Radiation Management Corporation will be digging, in order that DNR may test for the presence of chemical hazardous wastes. On October 1, 1980 DNR sent a written request to the NRC asking for written confirmation of this permission. No reply has been received yet.

All data collected so far has been given to the St. Louis County Health Department for review and possible action regarding drinking water supplies.

* Manganese levels violate a secondary drinking water standard which is not a health related standard.



WESTLAKE LANDFILL
Portage Des Sioux
Machens
White Corn
Wilke
Golden Eagle
Orchard Farm
Black Walnut
West Alton
Pelican Island
Halls Ferry
Peruque
Dardenne Lake
South Shore
Blase
St. Charles Airport
Marais Croche
Cul de Sac
Boschertown
Elm Point
Gardnerville
Ft. Bellefontaine
Missouri
Snowdown
Black Jack
Spanish Lake
St. Peters
St. Charles
Hazelwood
Florissant
Earth City
Bridgeton
Robertson
Berkeley
Calverton Park
Dellwood
All Saints Village
Cottleville
Harvester
Lambert St. Louis International Airport
Kinloch
Ferguson
Bellefontaine Neighbors
Moline Acres
Vigus
Edmundson
Woodson
St. Ann
Jennings
Jungs
Creve Coeur Airport
Maryland Heights
St. John
Creve Coeur Station
Bel-Ridge
Bellerive
Lindbergh
Overland
Charlack
Normandy
Fee Fee
Vinita Park
Hanley Hills
Pagedale
Fernridge
Olivette
University City
Wellston
Lac du Bois
Creve Coeur
Ladue
Clayton
Richmond
Missouri River

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2642

Reported to Robert Robinson, Director Date 11-16-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #38

Collected by Keith Schardein, Supervisor Date 6-14-79 1130

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed prior to sampling.

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	<2	mg/1	
COD	93	mg/1	
Suspended Solids (NFS)	88	mg/1	
NH_3 as N	<0.1	mg/1	
NO_3+NO_2 as N	<0.1	mg/1	
Total P	<0.02	mg/1	
TDS	574	mg/1	
TOC	35	mg/1	
CN^-, Total	<0.02	mg/1	distilled 6-15-79 analyzed 9-12-79
pH	7.5	Units	field
Specific Cond.	1010	mmho/cm 25° C	field
Total Alkalinity	322	mg/1	field
Fluoride	0.07	mg/1	
Chloride	54	mg/1	
Sulfate	136	mg/1	
Total Hardness	520	mg/1	
Total Sulfide	<0.1	mg/1	
Cadmium, dissolved	<1	ug/1	
Chromium, dissolved	2	ug/1	
Copper, dissolved	1	ug/1	
Iron, dissolved	140	ug/1	
Lead, dissolved	4	ug/1	
Manganese, dissolved	620	ug/1	
Mercury, dissolved	.4	ug/1	
Nickel, dissolved	<10	ug/1	
Zinc, dissolved	560	ug/1	
Potassium, dissolved	38.0	mg/1	
Sodium, dissolved	7.54	mg/1	
Calcium, dissolved	97.8	mg/1	
Magnesium, dissolved	42.8	mg/1	
Arsenic, dissolved	<4	ug/1	
Silver, dissolved	<1	ug/1	

Robert Robinson, Director
Solid Waste Management Program
ple No. 79-2642
November 16, 1979

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2641

Reported to Robert Robinson, Director Date 11-16-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #39

Collected by Keith Schardein, Supervisor Date 6-14-79 1040

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed prior to sampling.

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	7	mg/l	
COD	85	mg/l	
Suspended Solids (NFS)	139	mg/l	
NH_3 as N	0.6	mg/l	
NO_3+NO_2 as N	0.1	mg/l	
Total P	<0.02	mg/l	
TDS	607	mg/l	
TOC	33	mg/l	
CN^-, Total	< 0.02	mg/l	distilled 6-15-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	1000	mmho/cm 25° C	field
Total Alkalinity	236	mg/l	field
Fluoride	0.06	mg/l	
Chloride	63	mg/l	
Sulfate	184	mg/l	
Total Hardness	480	mg/l	
Total Sulfide	<0.1	mg/l	
Cadmium, dissolved	< 1	ug/l	
Chromium, dissolved	< 2	ug/l	
Copper, dissolved	14	ug/l	
Iron, dissolved	< 20	ug/l	
Lead, dissolved	4	ug/l	
Manganese, dissolved	400	ug/l	
Mercury, dissolved	<.1	ug/l	
Nickel, dissolved	30	ug/l	
Zinc, dissolved	21	mg/l	
Potassium, dissolved	8.12	mg/l	
Sodium, dissolved	35.2	mg/l	
Calcium, dissolved	83.2	mg/l	
Magnesium, dissolved	44.9	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	< 1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2640

Reported to Robert Robinson, Director Date 11-16-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill Test Well #36

Collected by Keith Schardein, Supervisor Date 6-14-79 0915

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed prior to sampling.

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	55	mg/l	
COD	125	mg/l	
Suspended Solids (NFS)	372	mg/l	
NH_3 as N	0.5	mg/l	
NO_3+NO_2 as N	0.2	mg/l	
Total P	0.06	mg/l	
TDS	660	mg/l	
TOC	54	mg/l	
pH	7.1	Units	field
Specific Cond.	1200	mmho/cm 25° C	field
Total Alkalinity	628	mg/l	field
Fluoride	0.04	mg/l	
Chloride	29	mg/l	
Sulfate	43	mg/l	
Total Hardness	600	mg/l	
Total Sulfide	<0.1	mg/l	
CN^-, Total	<0.02	mg/l	distilled 6-15-79 analyzed 9-12-79
Cadmium, dissolved	< 1	ug/l	
Chromium, dissolved	2	ug/l	
Copper, dissolved	2	ug/l	
Iron, dissolved	17.2	mg/l	
Lead, dissolved	5	ug/l	
Manganese, dissolved	2000	ug/l	
Mercury, dissolved	.5	ug/l	
Nickel, dissolved	< 10	ug/l	
Zinc, dissolved	590	ug/l	
Potassium, dissolved	2.08	mg/l	
Sodium, dissolved	29.6	mg/l	
Calcium, dissolved	156	mg/l	
Magnesium, dissolved	40.0	mg/l	
Arsenic, dissolved	31	ug/l	
Silver, dissolved	< 1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2639

Reported to Robert Robinson, Director Date 11-15-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #37

Collected by Keith Schardein, Supervisor Date 6-14-79 0820

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed prior to sampling.

PARAMETER	RESULTS	UNITS	REMARKS
COD	22	mg/l	
NH_3 as N	<0.1	mg/l	
NO_3+NO_2 as N	0.5	mg/l	
Total P	0.07	mg/l	
TDS	-	-	no sample
TOC	28	mg/l	
pH	7.4	Units	field
Specific Cond.	1680	mmho/cm 25° C	field
Total Alkalinity	540	mg/l	field
Fluoride	0.05	mg/l	
Chloride	13	mg/l	
Sulfate	415	mg/l	
Total Hardness	960	mg/l	
Cadmium, dissolved	<1	ug/l	
Chromium, dissolved	< 2	ug/l	
Copper, dissolved	15	ug/l	
Iron, dissolved	< 20	ug/l	
Lead, dissolved	4	ug/l	
Manganese, dissolved	300	ug/l	
Nickel, dissolved	<10	ug/l	
Zinc, dissolved	1020	ug/l	
Potassium, dissolved	4.09	mg/l	
Sodium, dissolved	6.32	mg/l	
Calcium, dissolved	258	mg/l	
Magnesium, dissolved	71.2	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	<1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2638

Reported to Robert Robinson, Director Date 11-15-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #37A

Collected by Keith Schardein, Supervisor Date 6-13-79 1545

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed.

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	3	mg/l	
COD	58	mg/l	
Suspended Solids (NFS)	374	mg/l	
NH_3 as N	0.2	mg/l	
NO_3+NO_2 as N	0.1	mg/l	
Total P	<0.02	mg/l	
TDS	474	mg/l	
TOC	26	mg/l	
CN^-, Total	<0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.5	Units	field
Specific Cond.	840	mmho/cm 25° C	field
Total Alkalinity	268	mg/l	field
Fluoride	0.06	mg/l	
Chloride	73	mg/l	
Sulfate	66	mg/l	
Total Hardness	360	mg/l	
Total Sulfide	<0.1	mg/l	
Cadmium, dissolved	<1	ug/l	
Chromium, dissolved	6	ug/l	
Copper, dissolved	8	ug/l	
Iron, dissolved	<20	ug/l	
Lead, dissolved	6	ug/l	
Manganese, dissolved	1490	ug/l	
Mercury, dissolved	.2	ug/l	
Nickel, dissolved	<10	ug/l	
Zinc, dissolved	30	mg/l	
Potassium, dissolved	5.50	mg/l	
Sodium, dissolved	29.2	mg/l	
Calcium, dissolved	84.5	mg/l	
Magnesium, dissolved	23.5	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	<1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2637

Reported to Robert Robinson, Director Date 11-15-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #35

Collected by Keith Schardein, Supervisor Date 6-13-79 1500

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed.

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	5	mg/l	
COD	122	mg/l	
Suspended Solids (NFS)	119	mg/l	
NH_3 as N	0.2	mg/l	
NO_3+NO_2 as N	0.1	mg/l	
Total P	0.06	mg/l	
TDS	571	mg/l	
TOC	35	mg/l	
CN^-, Total	<0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	890	mmho/cm 25° C	field
Total Alkalinity	234	mg/l	field
Fluoride	0.04	mg/l	
Chloride	96	mg/l	
Sulfate	126	mg/l	
Total Hardness	500	mg/l	
Total Sulfide	<0.1	mg/l	
Cadmium, dissolved	1	ug/l	
Chromium, dissolved	2	ug/l	
Copper, dissolved	5	ug/l	
Iron, dissolved	57	ug/l	
Lead, dissolved	4	ug/l	
Manganese, dissolved	1730	ug/l	
Mercury, dissolved	<.1	ug/l	
Nickel, dissolved	24	ug/l	
Zinc, dissolved	17	mg/l	
Potassium, dissolved	7.35	mg/l	
Sodium, dissolved	39.3	mg/l	
Calcium, dissolved	85.1	mg/l	
Magnesium, dissolved	32.0	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	<1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2636

Reported to Robert Robinson, Director Date 11-15-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #34

Collected by Keith Schardein, Supervisor Date 6-13-79 1330

Affiliation Water Quality Monitoring Section

Remarks Note: 1. Sample collected with metal sampler with lead weight.
2. Well not bailed.

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	13	mg/l	
COD	129	mg/l	
Suspended Solids (NFS)	122	mg/l	
NH_3 as N	1.2	mg/l	
NO_3+NO_2 as N	0.3	mg/l	
Total P	<0.02	mg/l	
TDS	417	mg/l	
TOC	31	mg/l	
CN^-, Total	<0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	740	mmho/cm 25° C	field
Total Alkalinity	220	mg/l	field
Fluoride	0.05	mg/l	
Chloride	67	mg/l	
Sulfate	70	mg/l	
Total Hardness	340	mg/l	
Total Sulfide	<0.1	mg/l	
Cadmium, dissolved	< 1	ug/l	
Chromium, dissolved	< 2	ug/l	
Copper, dissolved	3	ug/l	
Iron, dissolved	<10	ug/l	
Lead, dissolved	5	ug/l	
Manganese, dissolved	690	ug/l	
Mercury, dissolved	<.1	ug/l	
Nickel, dissolved	<10	ug/l	
Zinc, dissolved	21	mg/l	
Potassium, dissolved	5.76	mg/l	
Sodium, dissolved	31.6	mg/l	
Calcium, dissolved	50.4	mg/l	
Magnesium, dissolved	33.0	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	<1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2635

Reported to Robert Robinson, Director Date 11-15-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #40

Collected by Keith Schardein, Supervisor Date 6-13-79 1115

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight
2. Well not bailed completely

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	3	mg/l	
COD	19	mg/l	
Suspended Solids (NFS)	123	mg/l	
NH_3 as N	<0.1	mg/l	
NO_3+NO_2 as N	0.3	mg/l	
Total P	<0.02	mg/l	
TDS	833	mg/l	
TOC	20	mg/l	
CN^-, Total	<0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	1400	mmho/cm 25° C	field
Total Alkalinity	550	mg/l	field
Fluoride	0.02	mg/l	
Chloride	60	mg/l	
Sulfate	136	mg/l	
Total Hardness	720	mg/l	
Total Sulfide	<0.1	mg/l	
Cadmium, dissolved	6	ug/l	
Chromium, dissolved	2	ug/l	
Copper, dissolved	7	ug/l	
Iron, dissolved	<20	ug/l	
Lead, dissolved	4	ug/l	
Manganese, dissolved	1.4	ug/l	
Mercury, dissolved	<.1	ug/l	
Nickel, dissolved	10	ug/l	
Zinc, dissolved	18	mg/l	
Potassium, dissolved	7.87	mg/l	
Sodium, dissolved	31.7	mg/l	
Calcium, dissolved	172	mg/l	
Magnesium, dissolved	44.8	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	<1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2634

Reported to Robert Robinson, Director Date 11-13-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #41

Collected by Keith Schardein, Supervisor Date 6-13-79 0900

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: Sample collected with metal sampler with lead weight

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	3	mg/l	
COD	23	mg/l	
Suspended Solids (NFS)	153	mg/l	
NH_3 as N	< 0.1	mg/l	
NO_3+NO_2 as N	1.7	mg/l	
Total P	< 0.02	mg/l	
TDS	2200	mg/l	
TOC	16	mg/l	
CN^-, Total	< 0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	3000	mmho/cm 25° C	field
Total Alkalinity	698	mg/l	field
Fluoride	0.03	mg/l	
Chloride	262	mg/l	
Sulfate	690	mg/l	
Total Hardness	1540	mg/l	
Total Sulfide	< 0.1	mg/l	
Cadium, dissolved	4	ug/l	
Chromium, dissolved	5	ug/l	
Copper, dissolved	47	ug/l	
Iron, dissolved	< 20	ug/l	
Lead, dissolved	6	ug/l	
Manganese, dissolved	1.1	ug/l	
Mercury, dissolved	0.2	ug/l	
Nickel, dissolved	32	ug/l	
Zinc, dissolved	16	mg/l	
Potassium, dissolved	8.07	mg/l	
Sodium, dissolved	110	mg/l	
Calcium, dissolved	426	mg/l	
Magnesium, dissolved	96.4	mg/l	
Arsenic, dissolved	5	ug/l	
Silver, dissolved	< 1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2634

Reported to Robert Robinson, Director Date 11-13-79
Affiliation Solid Waste Management Program
Sample Description West Lake Landfill - Test Well #41
Collected by Keith Schardein, Supervisor Date 6-13-79 0900
Affiliation Water Quality Monitoring Section - Lab Services
Remarks Note: Sample collected with metal sampler with lead weight

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	3	mg/l	
COD	23	mg/l	
Suspended Solids (NFS)	153	mg/l	
NH_3 as N	< 0.1	mg/l	
$NO3+NO_2$ as N	1.7	mg/l	
Total P	< 0.02	mg/l	
TDS	2200	mg/l	
TOC	16	mg/l	
CN^-, Total	< 0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	3000	mmho/cm 25° C	field
Total Alkalinity	698	mg/l	field
Fluoride	0.03	mg/l	
Chloride	262	mg/l	
Sulfate	690	mg/l	
Total Hardness	1540	mg/l	
Total Sulfide	< 0.1	mg/l	
Cadium, dissolved	4	ug/l	
Chromium, dissolved	5	ug/l	
Copper, dissolved	47	ug/l	
Iron, dissolved	< 20	ug/l	
Lead, dissolved	6	ug/l	
Manganese, dissolved	1.1	ug/l	
Mercury, dissolved	0.2	ug/l	
Nickel, dissolved	32	ug/l	
Zinc, dissolved	16	mg/l	
Potassium, dissolved	8.07	mg/l	
Sodium, dissolved	110	mg/l	
Calcium, dissolved	426	mg/l	
Magnesium, dissolved	96.4	mg/l	
Arsenic, dissolved	5	ug/l	
Silver, dissolved	< 1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh

MISSOURI DEPARTMENT OF NATURAL RESOURC
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

REPORT OF SAMPLE ANALYSIS
LANDFILL MONITORING PROJECT

NAME OF FACILITY *West Lake Landfill*

SAMPLES COLLECTED BY *Mike Lincoln* DATE(S) *10-1-80*

NOTE:

SAMPLE DESCRIPTION	*Well #41*	*Well #40*	*Hahn Farmhouse Well*
DATE COLLECTED	*10-1-80*	*10-1-80*	*10-1-80*
SAMPLE NUMBER	*80-7418*	*80-7419*	*80-7420*
pH Units	*6.3*	*6.7*	*6.7*
Specific Cond. (umhos/cm @ 25° C)	*4000*	*1450*	*1000*
Milligrams per liter			
BOD	*< 12*	*< 12*	*54*
COD	*19.6*	*25.8*	*90.9*
NH_3 as N	*0.31*	*0.09*	*0.15*
NO_3+NO_2 as N	*3.00*	*< 0.05*	*0.47*
Total P	*0.07*	*0.03*	*0.03*
Total Sulfide	*< 0.1*	*< 0.1*	*< 0.1*
TOC	*63.1*	*37.6*	*67.3*
Total Cyanide	*< 0.01*	*< 0.01*	*< 0.01*
Non-Filterable Residue (SS)	*126*	*162*	*300*
Filterable Residue (TDS)	*2744*	*839*	*496*
Alkalinity as $CaCO_3$	*690*	*500*	*360*
Fluoride	*0.17*	*0.19*	*0.61*
Chloride	*250*	*7.07*	*1.0*
Sulfate	*1100*	*177*	*44*
Hardness as $CaCO_3$ (Ca, Mg, Fe, Zn, Mn)	*1450*	*591*	*399*
Potassium, *Dissolved*	*12.3*	*7.6*	*6.9*
Sodium, *Dissolved*	*268*	*33.8*	*6.1*
Calcium, *Dissolved*	*429*	*166*	*122*
Magnesium, *Dissolved*	*93*	*43*	*23*
Micrograms per liter			
Cadmium, *Dissolved*	*7.2*	*0.6*	*0.1*
Chromium, *Dissolved*	*< 5*	*< 5*	*< 5*
Copper, *Dissolved*	*5*	*5*	*< 1*
Iron, *Dissolved*, *mg/l*	*2.08*	*2.82*	*3.13*
Lead, *Dissolved*	*4*	*3*	*2*
Manganese, *Dissolved*	*670*	*1310*	*770*
Mercury, *Dissolved*	*QNS**	*QNS**	*QNS**
Nickel, *Dissolved*	*110*	*< 20*	*< 20*
Zinc, *Dissolved*, *mg/l*	*9.72*	*3.50*	*0.05*
Arsenic, *Dissolved*	*< 5*	*< 5*	*< 5*
Silver, *Dissolved*	*0.4*	*0.2*	*0.4*

**Quantity not sufficient*

LSP-69/5-5-80

MISSOURI DEPARTMENT OF NATURAL RESOURC
DIVISION OF ENVIRONMENTAL QUALITY
LABORATORY SERVICES PROGRAM

REPORT OF SAMPLE ANALYSIS
LANDFILL MONITORING PROJECT

NAME OF FACILITY West Lake Landfill

SAMPLES COLLECTED BY Mike Lincoln DATE(S) 10-1-80

NOTE:

SAMPLE DESCRIPTION	Fox Fish Market Well	Shallow Well @ Bob's Auto Parts
DATE COLLECTED	10-1-80	10-1-80
SAMPLE NUMBER	80-7421	80-7422
pH Units	6.6	6.6
Specific Cond. (umhos/cm @ 25° C)	950	1900
Milligrams per liter		
BOD	< 12	< 12
COD	4.3	12.1
NH_3 as N	0.37	0.23
NO_3+NO_2 as N	< 0.05	< 0.05
Total P	0.21	0.43
Total Sulfide	< 0.1	< 0.1
TOC	18.0	35.7
Total Cyanide	< 0.01	< 0.01
Non-Filterable Residue (SS)	11	38
Filterable Residue (TDS)	492	918
Alkalinity as $CaCO_3$	396	580
Fluoride	0.42	0.22
Chloride	7.0	112
Sulfate	63	84
Hardness as $CaCO_3$ (Ca, Mg, Fe, Zn, Mn)	394	623
Potassium , *Dissolved*	3.8	10.3
Sodium, *Dissolved*	18.4	54.5
Calcium, *Dissolved*	110	187
Magnesium, *Dissolved*	29	38
Micrograms per liter		
Cadmium , *Dissolved*	0.2	0.7
Chromium , *Dissolved*	< 5	< 5
Copper , *Dissolved*	4	3
Iron , *Dissolved, mg/l*	4.18	18.6
Lead , *Dissolved*	2	7
Manganese , *Dissolved*	290	790
Mercury , *Dissolved*	QNS*	QNS*
Nickel , *Dissolved*	< 20	< 20
Zinc , *Dissolved, mg/l*	0.02	1.39
Arsenic , *Dissolved*	< 5	< 5
Silver , *Dissolved*	0.2	0.3

*Quantity not sufficient

LSP-69/5-5-80

Jim Long

MEMORANDUM

Date: October 2, 1980

To: Bob Schreiber

From: Burt McCullough

Subject: Westlake Landfill

Westlake Landfill, located in Bridgeton Missouri (St. Louis County) has been the subject of recent inquiry. This landfill began operation prior to state regulation. As far as our records show, this landfill first opened in the mid-1960's. Part of the landfill lies in an old quarry and part of the landfill lies in the Missouri River floodplain, approximately 1½ miles from the river. Witnesses to this operation, when the area of the landfill which lies in the floodplain was in operation, note that the fill area was often actually beneath the level of the water table. According to file materials from Missouri Geological Survey, it is "highly probable that leachate from the landfill is entering the waters of the Missouri River. . . " Leachate from the old quarry area of the landfill is collected and hauled to MSD treatment plants. Construction of onsite treatment facilities is underway. About 48,000 gallons of leachate per day is currently being collected.

Aside from normal landfill materials, there are chemical industrial wastes and radiologically contaminated materials deposited in this landfill. The chemical wastes, that we know of, include about 4,000 tons of residues from the production of insecticides and herbicides. These pesticide wastes were deposited by Chevron Chemical Company. Also included in the chemical wastes are waste materials from ink manufacture and from the manufacture of glue. Among the chemical wastes that we know of in Westlake Landfill are:

waste ink	pigments	oily sludges
esters	alcohols	insecticides
halogenated intermediates		aromatics
oils	wastewater sludges	
heavy metals	asbestos	herbidices

Besides chemical hazardous wastes, in Westlake Landfill, there are radioactive wastes. During early 1973 Cotter Corporation buried radioactive Barium Sulfate Slag material and radiologically contaminated building rubble. There are approximately 9,000 tons of this material which contain about 7,000 tons of natural Uranium. In October, 1977, an aerial radiological survey was done to determine the location of the burial of this contaminated material. The report from this survey indicates that there are two burial sites. One is in the center of the old quarry area, and the other is on the edge of the floodplain area which borders adjacent farmland. The U.S Nuclear Regulatory Commission has contracted Radiation Management Corporation to do extensive on-site radiological surveys which include groundwater analysis, core sampling, test boring, and other tests as deemed necessary. The NRC has given DNR verbal

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314)751-3241
Joseph P. Teasdale Governor
Fred A. Lafser Director
Division of Environmental Quality
Robert J. Schreiber Jr., P.E. Director

permission to utilize the monitoring wells which Radiation Management Corporation will be digging, in order that DNR may test for the presence of chemical hazardous wastes.

There is little known about what went into Westlake Landfill prior to State regulation. Analysis needs to be done to determine: 1) what wastes are deposited in Westlake Landfill, 2) if any of these pollutants are leaving the landfill via groundwater, and 3) what threat does Westlake Landfill pose to drinking water supplies.

cc: Fred Lafser
Ron Kucera
Jim Long
Robert Robinson
Bob Miller
Tom Doan

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 176 Jefferson City, Missouri 65102 (314) 751-4422

7.

OCT 3 1980

October 1, 1980

William Crow
United States Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Crow:

I would like to take this opportunity to express my interest in the work that the Nuclear Regulatory Commission is doing at the Westlake Landfill in Bridgeton, Missouri. It is my understanding that an independent contractor, Radiation Management Corporation, will be doing an intensive survey of this site which will include the drilling of sampling wells.

As you know, Westlake Landfill has come under scrutiny recently because of possible dumping of hazardous chemical wastes.

I would like to ask your permission for the Missouri Department of Natural Resources to utilize your sampling wells in order to determine whether or not the hazardous chemical wastes are actually present. Your cooperation in this matter is greatly appreciated.

If at any time I or members of my staff can be of assistance, don't hesitate to contact me.

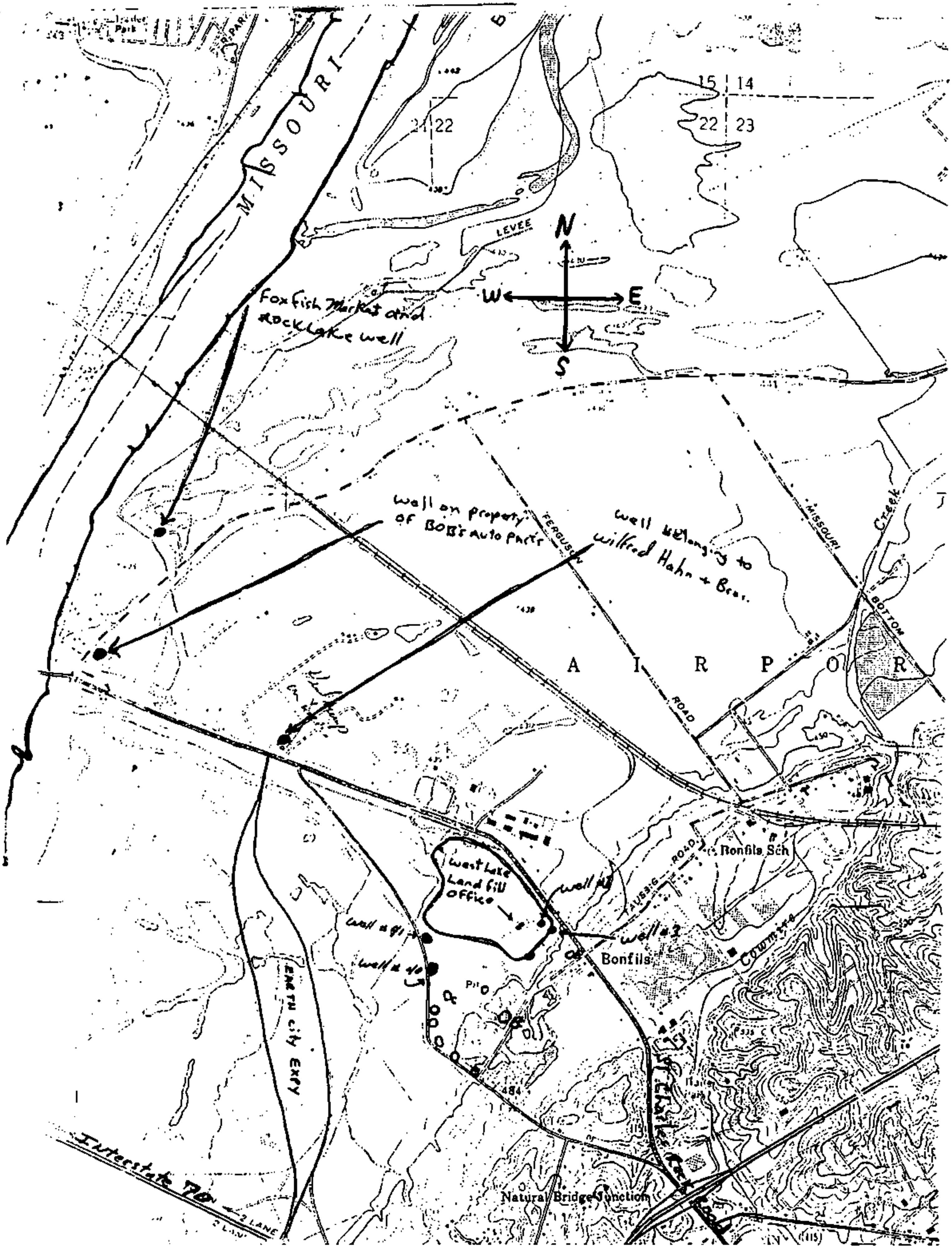
Sincerely,

DEPARTMENT OF NATURAL RESOURCES

ORIGINAL SIGNED BY
Fred A. Lafser
FRED A. LAFSER
Director

FAL/BEM/ra

cc: James Long
Water Pollution Control Program


MISSOURI
LEVEE
N
W
E
S
15
14
21
22
22
23
Foxfish Market and Rocklake well
well on property of BOB's Auto Parts
well belonging to Wilfred Hahn + Bros.
FERGUSON ROAD
MISSOURI BOTTOM ROAD
Creek
A I R P O R
Bonfils Sch
AUSSIG ROAD
West Lake Land fill office
well #2
well #3
well #1
well #40
Bonfils
Coweta
EARTH city Expy
Interstate 70
2 LANE
Natural Bridge Junction
St Charles Rock Road
484
115

MISSOURI DEPARTMENT OF NATURAL RESOURCES
P.O. Box 1368 2010 Missouri Blvd. Jefferson City, Missouri 65102 (314) 751-3241

LABORATORY SERVICES PROGRAM
REPORT OF SAMPLE ANALYSIS

SAMPLE NO. 79-2635

Reported to Robert Robinson, Director Date 11-15-79

Affiliation Solid Waste Management Program

Sample Description West Lake Landfill - Test Well #40

Collected by Keith Schardein, Supervisor Date 6-13-79 1115

Affiliation Water Quality Monitoring Section - Lab Services

Remarks Note: 1. Sample collected with metal sampler with lead weight
2. Well not bailed completely

PARAMETER	RESULTS	UNITS	REMARKS
BOD_5	3	mg/l	
COD	19	mg/l	
Suspended Solids (NFS)	123	mg/l	
NH_3 as N	<0.1	mg/l	
NO_3+NO_2 as N	0.3	mg/l	
Total P	<0.02	mg/l	
TDS	833	mg/l	
TOC	20	mg/l	
CN^-, Total	<0.02	mg/l	distilled 6-14-79 analyzed 9-12-79
pH	7.4	Units	field
Specific Cond.	1400	mmho/cm 25° C	field
Total Alkalinity	550	mg/l	field
Fluoride	0.02	mg/l	
Chloride	60	mg/l	
Sulfate	136	mg/l	
Total Hardness	720	mg/l	
Total Sulfide	<0.1	mg/l	
Cadmium, dissolved	6	ug/l	
Chromium, dissolved	2	ug/l	
Copper, dissolved	7	ug/l	
Iron, dissolved	<20	ug/l	
Lead, dissolved	4	ug/l	
Manganese, dissolved	1.4	ug/l	
Mercury, dissolved	<.1	ug/l	
Nickel, dissolved	10	ug/l	
Zinc, dissolved	18	mg/l	
Potassium, dissolved	7.87	mg/l	
Sodium, dissolved	31.7	mg/l	
Calcium, dissolved	172	mg/l	
Magnesium, dissolved	44.8	mg/l	
Arsenic, dissolved	<4	ug/l	
Silver, dissolved	<1	ug/l	

The analysis of this sample was performed in accordance with procedures as outlined in the latest edition of Standard Methods for the Examination of Water and Wastewater, EPA manual of Methods for Chemical Analysis of Water and Wastes, and/or Annual Book of ASTM Standards.

James H. Long, Director
Laboratory Services Program
Division of Environmental Quality

JHL/lh